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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,762	10/27/2005	Kotaro Tsurusaki	199372005500	9536

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MORRISON & FOERSTER, LLP
555 WEST FIFTH STREET
SUITE 3500
LOS ANGELES, CA 90013-1024

EXAMINER

MACARTHUR, SYLVIA

ART UNIT	PAPER NUMBER
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1792

MAIL DATE	DELIVERY MODE
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12/04/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/540,762	Applicant(s) TSURUSAKI ET AL.	
	Examiner Sylvia R. MacArthur	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/20/2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 12-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/14/2005; 6/24/2005</u> | 6) <input type="checkbox"/> Other: _____ |

Election/Restrictions

1. Claims 12-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected method and product, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 8/20/2007.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Toshima et al (US 2002/0045008).

The prior art of Toshima et al teaches a substrate treatment tank and device.

Regarding claims:

1. The liquid treatment apparatus of Toshima et al performs a liquid treatment to process objects, comprising: a process bath (processing vessel 10) adapted to contain a process liquid and a process object therein; a plurality of process liquid supply nozzles 14, 74, and 43 (note the type of fluid (liquid or gas) and the specific use of the fluid supplied thru the nozzles is interpreted as a matter of an intended use where all the nozzles mentioned are inherently capable of supplying a liquid) arranged at different levels beside the process objects in the process bath, each of the nozzles having a discharge port directed toward the process object contained in the

process bath; a plurality of process liquid supply valves (see valves in Figures) adapted to control a supply of the process liquid from a process liquid supply source to the process liquid supply nozzles; and a sequence controller (CPU 100) configured to control operations of the process liquid supply valves according to a predetermined sequence of operations, so that one or more process liquid supply nozzles selected from said plurality of process liquid supply nozzles discharge the process liquid in each of a plurality of process liquid supply periods, and that, a process liquid supply condition of at least one of said plurality of process liquid supply nozzles in each of the process liquid supply periods is different from that in an immediately preceding process liquid supply period, see Figs. 1, 3, and 5-9 and review such citations as [0049], [0051], [0053], [0057].

2. The liquid treatment apparatus according to claim 1, wherein said plurality of process liquid supply nozzles are divided into a first group and a second group, the process liquid supply nozzles belonging to the first group are arranged at different levels on one side of the process object, and the process liquid supply nozzles belonging to the second group are arranged at different levels on another side of the process object., see Figures.

3. The liquid treatment apparatus according to claim 2, wherein said plurality of process liquid supply nozzles are arranged so that the first group includes process liquid supply nozzles each located at a level corresponding to that of each of the process liquid supply nozzles belonging to the second group, see Figures..

4. The liquid treatment apparatus according to claim 3, wherein: the liquid treatment is a treatment that treats the process object with a chemical liquid as the process liquid; and the

controller is configured to control the process liquid supply valves so that one of the process liquid supply nozzles of the first group and one of the process liquid supply nozzles of the second group, which are arranged at the same level, simultaneously discharge the process liquid at least in a part of said plurality of process liquid supply periods, the flow of each fluid is controlled by the CPU on the basis of concentration sensors, such that simultaneous flow of the fluids and/or different flow intervals are inherent.

5. The liquid treatment apparatus according to claim 3, wherein: the liquid treatment is a treatment that treats the process object with a chemical liquid as the process liquid; and the controller is configured to control the process liquid supply valves so that the following conditions are alternately achieved repeatedly at least in a part of said plurality of process liquid supply periods: a condition in which one of the process liquid supply nozzles belonging to the first group discharges the chemical liquid while the process liquid supply nozzle belonging to the second group arranged at a level corresponding to that of said one of the process liquid supply nozzles belonging to the first group does not discharge the chemical liquid; and a condition in which one of the process liquid supply nozzles belonging to the second group discharges the chemical liquid while the process liquid supply nozzle belonging to the first group arranged at a level corresponding to that of said one of the process liquid supply nozzles belonging to the second group does not discharge the chemical liquid, the condition discussed here is interpreted as concentration. Note the type of fluid (liquid or gas) and the specific use of the fluid supplied thru the nozzles is interpreted as a matter of an intended use where all the nozzles mentioned are inherently capable of supplying a liquid.

6. The liquid treatment apparatus according to claim 1, wherein: the liquid treatment is a treatment that treats the process object with a rinse liquid as the process liquid; and the controller is configured to control the process liquid supply valves so that a lowermost one of said plurality of process liquid supply nozzles arranged at different levels discharges the rinse liquid, and thereafter the lowermost process liquid supply nozzle and at least one of process liquid supply nozzles selected from the process liquid supply nozzles other than the lowermost process liquid supply nozzle discharge the rinse liquid the flow of each fluid is controlled by the CPU on the basis of concentration sensors, such that simultaneous flow of the fluids and/or different flow intervals are inherent.

7. The liquid treatment apparatus according to claim 6, wherein the controller is configured to control the process liquid supply valves so that the lowermost process liquid supply nozzle discharges the rinse liquid, and thereafter all the process liquid supply nozzles discharge the rinse liquid the flow of each fluid is controlled by the CPU on the basis of concentration sensors, such that simultaneous flow of the fluids and/or different flow intervals are inherent.

8. The liquid treatment apparatus according to claim 3, wherein: the liquid treatment is a treatment that treats the process object with a rinse liquid as the process liquid; and the controller is configured to control the process liquid supply valves so that, at least in one of said plurality of process liquid supply periods, one of the process liquid supply nozzles belonging to the first group discharges the rinse liquid while the process liquid supply nozzle belonging to the second

group arranged at a level corresponding to that of said one of the process liquid supply nozzles belonging to the first group does not discharge the rinse liquid the flow of each fluid is controlled by the CPU on the basis of concentration sensors, such that simultaneous flow of the fluids and/or different flow intervals are inherent. Note the type of fluid (liquid or gas) and the specific use of the fluid supplied thru the nozzles is interpreted as a matter of an intended use where all the nozzles mentioned are inherently capable of supplying a liquid.

9. The liquid treatment apparatus according to claim 1, wherein: the liquid treatment is a treatment that treats the process object with a chemical liquid diluted with a rinse liquid, as the process liquid; the process liquid supply source includes a chemical liquid supply source and a rinse liquid supply source; a chemical liquid supply line connected to the chemical liquid supply source merges into a process liquid supply line, which connects the rinse liquid supply source to the process liquid supply nozzles; the chemical liquid supply line is provided with a flow control device adapted to control a flow rate of the chemical liquid flowing from the chemical liquid supply line into the process liquid supply line; and the controller is configured to control the flow control device depending on a flow rate of the process liquid being supplied to the process liquid supply nozzles through the process liquid supply line so that a concentration of a chemical component in the process liquid is maintained substantially constant, see abstract and the discussion of concentration sensors.

10. The liquid treatment apparatus according to claim 9, wherein: the controller is configured to control the process liquid supply valves so that the number of the process liquid supply nozzles discharging the process liquid in one of the process liquid supply periods is

different from that of the process liquid supply nozzles discharging the process liquid in another process liquid supply period following said one of the process liquid supply periods; and the controller is also configured to control the flow control device depending on the number of the process liquid supply nozzles discharging the process liquid, so that the concentration of the chemical component in the process liquid flowing through the process liquid supply line in said one of the process liquid supply periods is identical to that in said another process liquid supply period see abstract and the discussion of concentration sensors.

11. The liquid treatment apparatus according to claim 9, wherein the flow control device is adapted to shut off a flow of the chemical liquid from the chemical liquid supply line into the process liquid supply line, thereby allowing said apparatus to selectively perform the liquid treatment using the chemical liquid diluted with the rinse liquid, or a liquid treatment using only the rinse liquid see abstract and the discussion of concentration sensors.

4. Claims 1-8 and 11 are rejected under 35 U.S.C. 102(a) as being anticipated by Toshima et al

The prior art of Toshima et al teaches a vessel body 3(process bath), a plurality of process liquid supply nozzles see Figs. 1, 6,9, 11,12, 16, 17 illustrates how the nozzles are arranged relative to each other and the bath. Toshima further teaches supply valves 143, 152, and 135 see Fig.9 and other valves in the Figures. The controllers of Toshima, such as 9, 121 are provided which acts as a sequential controller to ensure the independent control of the valves and flow controller of the processing fluid source. Note the type of fluid (liquid or gas) and the

specific use of the fluid supplied thru the nozzles is interpreted as a matter of an intended use where all the nozzles mentioned are inherently capable of supplying a liquid.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yabuta Mitsuo (cited in the IDS of 6/24/2005) in view of Pozniak et al (US 2002/00207714).

The prior art of Mitsuo teaches a cleaning bath 10 (process bath), a plurality of process liquid supply nozzles (discharge ports 7L,R and 14L,R) Fig. 1 a and b illustrates how the nozzles are arranged relative to each other and the bath.

Mitsuo fails to teach supply valves and a sequential controller.

The prior art of Pozniak et al teaches a precision liquid mixing apparatus wherein valves attached to the plurality of processing liquid sources are sequentially actuated and controlled by a sequential controller (electronic control section 46), see for example , the abstract and [0034] and page 4. The controller of Pozniak is configured to allow for independent control of the plurality of sources and thus simultaneous or different flow rates, intervals as desired. The motivation to modify the apparatus of Mitsuo to use the valves and sequential controller of Pozniak et al is that combined use of the valves and controller allow for the precise supply of processing fluids and

thus a more uniform process result. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention.

7. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toshima et al ('692) or Mitsuo in view of Pozniak in view (further) of Toshima et al (US 2002/0045008). The teachings of Toshima et al and Mituso in view of Pozniak et al were discussed above. Both apparatuses fail to each the use of concentration as the basis of flow control. The prior art of Toshima (US '008) was discussed above. The motivation to use concentration as the basis of process control is that concentration is a process control variable that is easily measured as shown by Toshima et al (US '008) with the concentration sensors and is a quantity that is useful in determining the uniformity of the process result. Thus, it would have been obvious for one of ordinary skill in the art to use the suggested teachings of Toshima et al (US '008) to use concentration as the basis of flow control as it is a conventionally measured quantity known for its reproducibility and ease of measurement in process control.


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-Th during the hours of 8 a.m. and 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Sylvia R MacArthur
Primary Examiner
Art Unit 1792

November 26, 2007